as a conservative proxy for the risk it would face in a competitive market. But as Dr. Vander Weide explained in his testimony, the cost of capital under that TELRIC construct actually would be "significantly higher" than what Verizon VA has employed, particularly if it had to reflect the risk that the network would be revalued based on the assumptions embodied in Petitioners' MSM. (VZ-VA Ex. 104 at 5.) The Commission itself has recognized that an appropriate cost of capital must take into account the regulatory risks inherent in TELRIC.[36/]

Petitioners' criticisms of and counterproposal to Verizon VA's approach suffer from one central and critical flaw: they are entirely inconsistent with TELRIC principles and with the network assumptions in the MSM and in AT&T/WorldCom's critique of Verizon VA's studies.[37/] AT&T/WorldCom's proposed cost of capital not only fails to account for the regulatory risks created by TELRIC, but also does not even purport to reflect the risk that Verizon VA would face in a competitive UNE market. Yet, as discussed above, even AT&T/WorldCom's economist has acknowledged that the cost of capital must at minimum be set in the context of such a competitive market.[38/] AT&T/WorldCom's use of a cost of capital that purportedly reflects the risk faced by incumbent LECs today, where competition has begun

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36/ FCC Reply Brief at 12 n.8.

37/ AT&T/WorldCom's proposed cost of debt is slightly higher (7.86%) than Verizon's proposal (7.55%). Although each party used different methods to arrive at its proposed cost of debt, the Commission could adopt either proposal in this proceeding.

38/ The Commission itself has likewise stated that UNE prices are intended to simulate the outcome of a competitive market, which necessarily requires that the cost of capital reflect the same assumption. *See, e.g.,* Memorandum Opinion and Order, *In the Matter of Application of Verizon New England Inc., Bell Atlantic Communications, Inc. (d/b/a Verizon Long Distance), NYNEX Long Distance Company (d/b/a Verizon Enterprise Solutions) and Verizon Global Networks, Inc. for Authorization to Provide In-Region InterLATA Services in Massachusetts,* 16 FCC Rcd 8988 ¶ 42 (rel. April 16, 2001) ("*Massachusetts § 271 Order*"); *Local Competition Order* at 15846, 15871 ¶¶ 679, 738.

to develop but is not full-blown, significantly understates forward-looking TELRIC costs.[39] (VZ-VA Ex. 104 at 35-43.) While AT&T/WorldCom's position is incorrect for several other reasons, discussed below, this fundamental and self-serving inconsistency, which is designed solely to decrease UNE costs, is sufficient to discredit Petitioners' cost of capital proposal in its entirety. **[BEGIN AT&T PROPRIETARY]**

[END AT&T PROPRIETARY]

1. AT&T/WorldCom Concede That Their Proposed Cost of Capital Violates TELRIC Principles.

As noted above, when pressed by Commission Staff, AT&T/WorldCom conceded at the hearings that the forward-looking cost of capital used in UNE cost studies must assume a fully competitive market, just like the assumptions contained in the UNE model's expense and investment components. As Ms. Murray acknowledged: "I think all the model's assumptions have to be consistent. So, to the degree that it requires a competitive market to get all of the other assumptions, that would be true for the cost of capital as well." (Tr. at 3202.) As Verizon's cost of capital expert Dr. James Vander Weide explained, a cost model that does not consistently reflect the competitive market assumption simply will not produce rates that replicate the costs that competitors would face in a competitive market. (VZ-VA Ex. 104 at 8.[40])

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[39] Verizon VA demonstrated that competition has already begun to develop in Virginia, including competition from facilities-based local service carriers and from alternative technologies such as cable, wireless, and IP telephony providers. (*See, e.g.*, VZ-VA Ex. 104 at 1-19 and Attachment A.)

[40] *See also* Tr. at 3475-82, 3525, 3529-30, 3548, 3562-63, 3568-69; VZ-VA Ex. 104 at 25-30; VZ-VA Ex. 112 at 2-4, 6-7, 14, 16-18, 20, 24, 39-40; VZ-VA Ex. 118 at 8-9, 12-18 at 8-9,

This problem is exacerbated because, under AT&T/WorldCom's vision of TELRIC, an ILEC faces not just the normal risks of a competitive market, but the even greater risks created by the assumption of instantaneous, ubiquitous and successive replacements.

Yet AT&T/WorldCom have expressly admitted that the cost of capital input they propose does not reflect conditions in a fully competitive market, let alone the additional regulatory risk inherent in TELRIC. AT&T/WorldCom propose a 9.54% cost of capital — one that is lower even than the 11.25% that the Commission noted years ago was a *starting place* for cost of capital considerations in a TELRIC model.[41/] As Mr. Hirshleifer stated throughout his testimony, this proposed cost of capital does *not* assume that Verizon VA will be operating in a fully competitive UNE market; rather, as he admitted during the hearing, it assumes "existing competition." (Tr. at 3626.) Indeed, despite Ms. Murray's concession to the contrary, he insists that no competitive market assumption is required under the FCC rules. (*See* AT&T/WCom Ex. 10 at 4-6.) Mr. Hirshleifer defends his proposed cost of capital and criticizes Verizon VA's on the ground that "[i]t is evident . . . that the FCC does not accept Dr. Vander Weide's argument . . . [that] there should be a hypothetical assumption that the risks of a fully competitive market exist for UNEs when in fact they do not." (AT&T/WCom Ex. 17 at 19; *see also* AT&T/WCom Ex. 10 at 5 (insisting that the FCC did not "intend[] a presumption of full competition"); *id.* at 6 ("It is clear that the FCC is not making the hypothetical assumption of full competition that Dr. Vander Weide would attribute to it."); *id.* at 11-12.)

12-18 (demonstrating that the *Local Competition Order,* subsequent FCC orders, the FCC Reply Brief, and general economic principles require consistent competitive market assumptions); VZ-VA Ex. 117 at 14 n.13, 16-17.

41/ *See Local Competition Order* at 15856 ¶ 702 (noting the Commission's finding that a cost of capital of 11.25% is a "reasonable starting point for TELRIC calculations").

As we show below in addressing each of Petitioners' major assertions, Mr. Hirshleifer's basic and misguided monopoly assumption underlies all his criticisms of Verizon VA's cost of capital. Thus, for example, he criticizes Dr. Vander Weide's use of the S&P industrials as a proxy to assess Verizon VA's forward-looking risk of providing UNEs on the ground that Verizon VA "ignores the critical facts that VZ-VA is overwhelmingly dominant in its territory." (AT&T/WCom Ex. 10 at 11; *see also* Tr. at 3629 ("[I]f we set aside TELRIC and are talking about a regulated company, it implies to me market dominance, and that's precisely why it's regulated.") (Hirshleifer).) In making these arguments, Mr. Hirshleifer apparently proceeded without regard to whether his approach was consistent with the assumptions underlying the majority of AT&T/WorldCom's TELRIC UNE cost analyses, explaining on cross examination that rather than review Petitioners' analysis, he simply "asked Ms. Murray to review [his] testimony and let me know whether there were any inconsistencies with the assumptions that [AT&T/WorldCom] were making in the case, and she said there were not." (Tr. at 3612.)

As noted above, of course, AT&T/WorldCom's own economist in fact believes that Mr. Hirshleifer's approach *is* contrary to the one that Petitioners contend must be used for UNE pricing. Ms. Murray testified several times that under "the Commission's Total Element Long Run Incremental Cost ('TELRIC') methodology, the prices for unbundled network elements should mimic the prices that would prevail if Verizon sold the same functionalities in a competitive market. Competitive market forces would drive prices down to efficient forward-looking economic costs." (AT&T/WCom Ex. 8 at 5; *see also* AT&T/WCom Ex. 11 at 5-6 ("TELRIC is the right methodology because, as this Commission explained when it adopted the TELRIC methodology in its Local Competition First Report and Order, 'Adopting a pricing methodology based on forward-looking, economic costs best replicates, to the extent possible,

the conditions of a competitive market.'").) Because AT&T/WorldCom have failed to follow these principles, their approach is internally inconsistent, and their proposed cost of capital must be rejected entirely.

Indeed, even if the Commission were willing to abandon its prior position — and its most recent statement to the Supreme Court recognizing that the cost of capital must take into account competitive and regulatory risks[42/] — it could not accept the cost of capital proposed by Petitioners. As Dr. Vander Weide and Dr. Shelanski explained, even the cost of capital used in Verizon VA's studies is not designed to reflect risks that would result from adopting the extreme, fantasy assumptions contained in AT&T/WorldCom's cost model. (VZ-VA Ex. 118 at 11-12; VZ-VA Ex. 117 at 13-14, 23, 33-34.) Under AT&T/WorldCom's successive instantaneous replacement theory, the corresponding cost of capital would be many times higher — if such a hypothetical carrier could obtain financing at all.[43/] (VZ-VA Ex. 104 at 5, 10, 31-32, 42; VZ-VA Ex. 118 at 11-12, 15; VZ-VA Ex. 101 at 13-14; VZ-VA Ex. 111 at 21.) No one can plausibly deny that providing UNEs in this type of environment would be extremely risky — particularly when CLECs are free to stop using Verizon's UNEs at any time. (VZ-VA Ex. 104 at 42; VZ-VA Ex. 101 at 13-14.)

42/ FCC Reply Brief at 12 n.8.

43/ One reason the cost of capital would have to be higher under the MSM assumptions is because the cost of capital must always include a risk premium to account for *un*anticipated technological change; depreciation lives can account only for development that is foreseen and consistent with expected trends. (Tr. at 3662-63.) In the MSM construct, that risk premium would be significantly greater, because the entire network could potentially, at any time, have to be replaced based on the assumption of full deployment of the latest new innovation.

2. AT&T/WorldCom's Cost of Capital Arguments Turn on Their Assumption That Verizon VA Is a Monopoly Provider.

a) Capital Structure

Verizon VA employed a capital structure consisting of 25% debt and 75% equity, which appropriately reflects the Commission's principles that rates must be based on forward-looking economic costs and reflect the conditions of a competitive market. To determine this capital structure, Dr. Vander Weide examined data for both a proxy group of S&P Industrials and a group of telecommunications companies with incumbent local exchange subsidiaries. He examined the most current available data for these companies and also reviewed data for the previous five years. In all periods, the average market value capital structure for these companies contained no more than 25% debt and no less than 75% equity. (VZ-VA Ex. 104 at 44.)

AT&T/WorldCom, on the other hand, derived their cost of capital figure by assuming a "book value" capital structure of 49% debt and 51% equity and a "market value" capital structure of 20% debt and 80% equity and then simply splitting the difference between the results. This entire approach turns on Mr. Hirshleifer's insistence that he may legitimately treat Verizon VA as a monopolist provider even while assessing its cost of capital in the forward-looking market. Thus, Mr. Hirshleifer specifically defended his decision to use a *book* value capital structure — which reflects historical rather than forward-looking costs — because, in his opinion, the book value capital structure better reflects the historical financing of the "traditional monopolistic local exchange business." (AT&T/WCom Ex. 10 at 34.) Not surprisingly, Mr. Hirshleifer's approach significantly reduces his recommended cost of capital.

As explained by Dr. Vander Weide, in a competitive market, investors and analysts rely upon market value capital structures, not book value capital structures, to estimate the cost of

capital. No reasonable economist would rely on a book value capital structure to estimate the forward-looking weighted average cost of capital, because book values reflect accounting conventions and purely historical costs.[44/] (VZ-VA Ex. 112 at 26-28.[45/]) In fact, Mr. Hirshleifer concedes that a market value capital structure should be used to estimate the cost of capital for companies in a high-risk, competitive market. (AT&T/WCom Ex. 10 at 33.)

b) Proxy Group

To determine Verizon VA's forward-looking cost of equity, Dr. Vander Weide used the S&P Industrials as a proxy group for the risk of providing UNEs in Virginia. As Dr. Vander Weide explained, the S&P Industrials consist of a broad sample of companies whose average risk reflects the typical risk a firm faces in a competitive market and that accordingly provide a useful though conservative approximation of the risk that a company like Verizon VA would face in a competitive UNE market. (VZ-VA Ex. 118 at 32-33.) In the absence of a large sample of public companies whose sole business is the provision of UNEs to competitors, Dr. Vander Weide determined that the S&P Industrials were a reasonable and appropriate proxy group. Dr. Vander Weide used a discounted cash flow analysis to determine a weighted average cost of equity for these companies of 14.75%. (VZ-VA Ex. 104 at 54.) While this value would be appropriate if UNE prices were set based on Verizon VA's real forward-looking costs, it actually

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[44/] Mr. Hirshleifer's observation that regulators have used book value capital structures in traditional rate of return hearings is correct but also irrelevant; a UNE cost proceeding is not a traditional rate of return hearing. In UNE proceedings, the Commission has expressly prohibited the use of unadjusted embedded costs of the sort used by Mr. Hirshleifer. (*See, e.g.*, VZ-VA Ex. 112 at 36-37.)

[45/] *See also* Copeland & Weston, *Financial Theory and Corporate Policy*, ch. 13 (3d ed. 1998); Brealey & Myers, *Principles of Corporate Finance* 214 (5th ed. 1996); Robert C. Higgins, *Analysis for Financial Management*, ch. 8 (4th ed. 1995).

understates the risks inherent in being required to provide UNEs to competitors in a TELRIC pricing world.[46/]

In contrast, AT&T/WorldCom used a proxy group consisting of Verizon, SBC, Bell South, and ALLTEL.[47/] As Dr. Vander Weide explained, this group simply is too small to calculate an accurate estimate of the cost of capital for use in UNE studies. (VZ-VA Ex. 112 at 38.) In addition, AT&T/WorldCom fail to recognize that their proxy group is less risky than the UNE business: their proxy group of telecommunications holding companies can diversify away many of the technology risks Verizon VA faces in a competitive UNE market, including increasing technology risk due to developments such as packet switching and wireless technologies, and competition from other providers, like the wireless and alternative access providers that *already* exist and almost certainly will expand in Verizon VA's market. (*See* VZ-VA Ex. 103 at 1-19 and Attachment 4; VZ-VA Ex. 104 at 38; VZ-VA Ex. 112 at 22-23.) There is also the particular risk associated with the provision of UNEs; Verizon VA is required to make a large sunk investment in UNE facilities, but has no guaranteed return on this investment. CLECs may purchase UNEs on a month-to-month basis while constructing their own facilities, and then abandon Verizon VA's network once they are in a position to offer facilities-based service. (VZ-VA Ex. 118 at 11.)

46/ In particular, as noted above, under an instantaneous, ubiquitous replacement version of TELRIC, the cost of capital would be higher than what Dr. Vander Weide has proposed. (*See* VZ-VA Ex. 111 at 19-21.)

47/ In his CAPM model, Mr. Hirshleifer added a fifth company, CenturyTel.

3. AT&T/WorldCom's Three-Stage DCF Model Produces Irrational Results.

AT&T/WorldCom proposed cost of equity is further flawed because of the assumptions contained in Mr. Hirshleifer's three-stage DCF model.[48/] Mr. Hirshleifer assumes that his proxy companies' earnings and dividends will grow in line with Value Line's dividend growth forecast in year one and the I/B/E/S analysts' earnings growth forecast in years two through five, decline over a period of fifteen years to his expected GNP growth rate of 6.29%, and then remain there permanently. (AT&T/WCom Ex. 5 at 16.) In addition to being completely arbitrary, these assumptions ignore that it is common for companies to grow at rates much greater than that of the GNP for long periods of time and that the average I/B/E/S rate of growth for the companies in Mr. Hirshleifer's proxy group is typically achievable for a period of longer than five years in a rapidly growing industry such as telecommunications. (*See* VZ-VA Ex. 112 at 44.) Mr. Hirshleifer also ignores the ample evidence that investors expect Dr. Vander Weide's telecommunications holding companies to grow at rates significantly higher than Mr. Hirshleifer's 6.29% in the long run.[49/] (*See* VZ-VA Ex. 112 at 44; VZ-VA Ex. 118 at 39.)

Mr. Hirshleifer's arbitrary and unsupported growth assumptions produce DCF results that significantly understate Verizon VA's cost of equity. Dr. Vander Weide demonstrated that Mr. Hirshleifer's DCF model produces the illogical result that *higher* risk companies have a *lower*

48/ Dr. Vander Weide explained at the hearings that what matters are the assumptions used and the results obtained by using a single-stage versus three-stage model, not the model itself. (Tr. at 3432-33, 3437-39, 3442, 3469-70, 3500-01.) Thus, the recent literature cited by AT&T/WorldCom regarding three-stage models is meaningless — the issue is whether the competing models in this case produce reasonable results.

49/ As Dr. Vander Weide explained, companies with higher expected growth have correspondingly higher risk, which means that investors demand an overall higher rate of return. Mr. Hirshleifer's model produces results that contradict the basic common sense standard that the cost of equity should increase with the risk of the investment. (VZ-VA Ex. 112 at 72-73.)

cost of equity than lower risk companies. (VZ-VA Ex. 112 at 71-75; VZ-VA Ex. 118 at 43-44.) Thus, for example, Mr. Hirshleifer's three-stage DCF model results in electric and natural gas distribution companies having higher costs of equity than the S&P Industrials. In contrast, Dr. Vander Weide showed that these aberrational results are not present when Verizon VA's single-stage, constant growth model is used instead of Mr. Hirshleifer's three-stage DCF model. (VZ-VA Ex. 118 at 4, 47.) AT&T/WorldCom's three-stage model therefore fails the basic test of reasonableness: higher risk companies should have higher costs of equity than lower risk companies.

Dr. Vander Weide further demonstrated the unreasonableness of Mr. Hirshleifer's three-stage DCF model by performing a regression analysis to determine whether investors actually use the I/B/E/S growth rates, rather than the average growth rate assumed in Mr. Hirshleifer's three-stage model, to value companies. As Dr. Vander Weide explained, a company's price-to-earnings ratio reflects the growth rates investors use in determining the value of a company. Thus, if investors use the I/B/E/S growth rates, as Dr. Vander Weide suggests, those rates should be significantly and positively correlated with price-to-earnings ratios — that is, a high growth rate should mean a high price-to-earnings ratio. Similarly, one would expect the same results if investors used Mr. Hirshleifer's growth rates. However, the use of Mr. Hirshleifer's average three-stage growth rates in the regression equation produces the illogical result that high growth companies would have lower price-to-earnings ratios. (*See* VZ-VA Ex. 192.)

In an attempt to show that his cost of equity estimate is reasonable, Mr. Hirshleifer points to the discount rates that a number of analysts have used in their fairness opinions regarding various telecommunications mergers. But these analysts assumed a discount rate for the purpose of evaluating the fairness of a stock exchange ratio to be used in proposed mergers — a

fundamentally different exercise than calculating forward-looking cost of capital estimates for UNE cost studies.[50/] The analysts' discount rates do not reflect *investors'* expected rates of return — the relevant yardstick for measuring a company's cost of equity — because the analysts' discount rates produce stock valuations that significantly *exceed* the actual prices of the merger candidates prior to the merger announcement. Thus, the analyst statements relied on by Mr. Hirshleifer plainly do not reflect investors' view of a company's cost of equity. (VZ-VA Ex. 112 at 70.)

4. AT&T/WorldCom's Alternative CAPM Analysis is Flawed.

Mr. Hirshleifer's Capital Asset Pricing Model ("CAPM") — which evaluates the risk-free rate, the company-specific risk, and the risk premium of a market portfolio — suffers from serious flaws. To estimate the risk premium on the market portfolio, Mr. Hirshleifer relied heavily on historical risk premium data. In analyzing this data, Mr. Hirshleifer improperly used geometric mean returns rather than the more correct arithmetic mean average return. In addition, Mr. Hirshleifer gave significant weight to historical data going back to *1802*, which for the reasons explained by Dr. Vander Weide, will not produce reliable results. (VZ-VA Ex. 112 at 54-55.) If Mr. Hirshleifer had used the arithmetic mean risk premium and had limited his analysis to data for the period going back to 1926 or 1945, Mr. Hirshleifer would have obtained significantly higher CAPM results that are more in line with Verizon's result. (*See* VZ-VA Ex. 112 at 55-56.)

[50/] Mr. Hirshleifer also ignores the fact that the discount rates he cites are after-tax discount rates, while the cost of capital for pricing purposes is a higher, pre-tax figure, and he also disregards the cautionary notes all of these firms include in their opinions about the use of the data contained in the opinion. (VZ-VA Ex. 112 at 65-68.)

Finally, Mr. Hirshleifer failed to make any adjustment for the tendency of the CAPM to underestimate the cost of equity for companies whose betas (a measure of a company's risk) are less than 1.0. (VZ-VA Ex. 112 at 58-59.) Instead, he simply used another set of betas that are significantly lower than the Value Line betas that investors use, which alone causes Mr. Hirshleifer's estimate of Verizon VA's cost of equity to be significantly understated. After correcting these flaws, Dr. Vander Weide's analysis showed that a more reasonable CAPM cost of equity is 14.4%. (VZ-VA Ex. 112 at 10.)

[BEGIN AT&T PROPRIETARY]

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C. Verizon VA's Engineer, Furnish and Install Factors

As noted above, the first step in Verizon VA's cost studies is to identify the underlying material investment, which is then adjusted by loading factors to produce a total installed investment cost: that is, the cost of the material plus the related engineering and installation (EF&I) costs, as well as relevant power and land and building costs.[51/] In each case, Verizon VA's study represents the estimate of the future cost relationship as a ratio, comparing these costs to the material cost. Petitioners did not question the legitimacy of the data or the approach used by Verizon VA to calculate the Land and Building or Power factors. And the questions they did raise with respect to the EF&I factors are unavailing: Verizon VA's EF&I factors produce an accurate and forward-looking assessment of the ratio of engineering and installation costs to material costs and should not be adjusted in any manner.

1. The Development of the EF&I Factors Is Reasonable and Reliable.

Verizon VA collected the data it uses to calculate its EF&I factors from its Detailed Continuing Property Record (DCPR) database.[52/] (Tr. at 5080-83.) EF&I factors were

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[51/] This is discussed in VZ-VA Ex. 107 at 40-44 and VZ-VA Ex. 122 at 52-57, 201-207.

[52/] EF&I factors are developed for digital circuit equipment, the digital switch, and SONET circuit and other terminal equipment; the EF&I costs of other facilities are already included in the total investment figures tracked by Verizon, which therefore do not require application of an EF&I factor. (VZ-VA Ex. 107 at 42.)

calculated by plant account, so that each class of plant has its own EF&I factor. In calculating the factors, Verizon VA considered the EF&I costs of the entire plant account on a region-wide basis in order to eliminate anomalies that might be present in a specific market in a specific year with respect to a particular piece of equipment, and to achieve the most complete, representative sample to use as the basis for estimating average EF&I costs. (VZ-VA Ex. 107 at 44.)

Petitioners attempted to discredit Verizon VA's reliance on the DCPR database by pointing to certain entries and suggesting that the EF&I costs associated with a particular item seemed unusually high. But as Verizon VA witness Lou Minion explained at the hearing, the specific allocation of the EF&I costs of a particular job to the individual components of that job does not and is not intended to reflect the actual installation costs of that particular component. (Tr. at 4647; *id.* at 5080-83.) Annual EF&I costs within each account for each job at each location are apportioned across all hardwire equipment associated with the relevant job on a pro rata basis on the basis of the equipment's underlying material cost. Thus, while the DCPR data with respect to the installation costs of any individual piece of equipment for any individual job would not be meaningful, the data in the aggregate over the course of the year *would* accurately reflect the cumulative EF&I costs for the plant account. (Tr. at 4647; *id.* at 5080-83.)

2. The EF&I Data is Forward-Looking.

Verizon VA used 1998 DCPR data to determine the EF&I factors. No effort was made to recover the EF&I costs of the equipment installed in 1998; rather, the EF&I data from that calendar year is used as the basis for estimating the *relationship* of installed investment to material-only investment for equipment installed in the forward-looking network. AT&T/WorldCom suggest that there is no basis for assuming that the 1998 data is representative of the level of EF&I costs that will exist in the forward-looking network. (AT&T/WCom Ex. 12

at 74-75.) To the contrary: there is no basis to assume that the EF&I relationships from 1998 will *differ* from those in the forward-looking network.

As Mr. Minion explained, the technology used to engineer and install equipment has not undergone any significant changes since 1998, nor are any significant changes anticipated in the foreseeable future. Indeed, AT&T/WorldCom have identified *no* technological or other change that might be expected in some way to reduce EF&I costs in the future. (VZ-VA Ex. 122 at 53-54.) Instead, they simply assert that EF&I expenses should decrease because material investment may be reduced in the forward-looking network. This is nonsensical. If it costs $10 (and takes a certain amount of time) to install a $100 door, that cost (and the time involved) should not change simply because the price of the door drops to $80. Indeed, because the EF&I costs are expressed as a factor, if the material cost of the underlying equipment were for some reason reduced significantly — for example, if the Commission were to conclude that Verizon VA's SONET equipment costs were too high — the existing EF&I factor for that plant account would have to be recalculated to avoid *understating* costs.[53/] Thus, the EF&I factors used by Verizon VA clearly are forward-looking.[54/]

[53/] For example, the EF&I factor for the $100 door above would be 1.1. If the door costs suddenly dropped to $80, applying the pre-existing factor of 1.1 would produce installation costs of only $8 — although in reality, there is no reason to assume that the installation cost has changed.

[54/] AT&T/WorldCom also try to argue that Verizon VA's EF&I factors seek to recover embedded costs by allegedly accounting for the costs of removal of older equipment and reconfiguration of office space rather than just the placement of new equipment. (AT&T/WCom Ex. 12 at 74-75.) As Mr. Minion demonstrated, this premise is simply wrong and reflects a complete misrepresentation — or at best a misunderstanding — of the relevant accounting rules. (VZ-VA Ex. 122 at 54-56.)

3. The Digital Loop Carrier and Digital Switch EF&I Factors Are Appropriate.

AT&T/WorldCom also raise specific criticisms about two particular EF&I factors: Verizon VA's DLC equipment EF&I factor, and its digital switch EF&I factor. In both cases, the criticisms — and the counterproposals or "solutions" proposed by AT&T/WorldCom — disintegrate upon close examination and reveal themselves to be nothing more than largely unprincipled attempts to achieve lower costs in any manner.

a) Verizon VA's Digital Loop Carrier EF&I Factor.

AT&T/WorldCom assert that Verizon VA overstated its EF&I factor for digital loop carrier (DLC) equipment by basing it on the combined EF&I costs for plug-in and hardwire equipment. (AT&T/WCom Ex. 12 at 75-76.) The criticism is puzzling. As explained at the hearing, because the DCPR database does not allocate EF&I costs to plug-in equipment, the EF&I factor for plug-in equipment consists *only* of sales tax: all the associated installation costs are recorded in the hardwire EF&I factor. (Tr. at 5081-82 (Minion).) Therefore, the only sensible means of producing a relevant digital loop carrier EF&I factor is to combine the plug-in and hardwire EF&I costs to produce a combined factor. AT&T/WorldCom propose to "restate" the DLC EF&I costs by using a plug-in only factor to produce plug-in EF&I costs, but, because the plug-in-only factor contains no installation costs, AT&T/WorldCom's proposal would grossly understate true plug-in EF&I costs. Only Verizon VA's approach makes any sense.

b) Verizon VA's Switching EF&I Factor

AT&T/WorldCom also criticize the 40.2% EF&I factor Verizon VA used in its switching cost studies,[55/] but here, too, their arguments are meritless. Despite their general argument, discussed above, that Verizon VA's *1998* data is outdated, AT&T/WorldCom in this instance insist that data from a far *earlier* date should be used — because they have managed to achieve significantly lower switching rates by manipulating the data through this particular inconsistency. AT&T/WorldCom's approach also simply ignores the manner in which EF&I factors are calculated.

AT&T/WorldCom propose a 27% switching EF&I factor, or approximately 60% of the factor employed by Verizon VA. (AT&T/WCom Ex. 12 at 121.) They do not suggest any basis to believe that this factor is realistic or could actually be achieved; in fact, both AT&T and WorldCom refused to provide their own EF&I data for switching to use as a basis for comparison when asked to do so by Verizon VA.[56/]

Instead, to develop their proposed factor, AT&T/WorldCom combined an 11% EF&I factor from a 1992 Verizon filing, which accounts for the local telephone company portion of the factor, with a 12% factor (plus sales tax) that they calculated from the SCIS model, which accounts for the vendor portion of the factor. This exercise makes no sense. The 1992 EF&I factor is based on EF&I costs and switching material investments that are nearly ten years old. To assume the relevance and utility of a 1992 factor in computing a current or future EF&I ratio

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55/ Contrary to AT&T and WorldCom's claims, Verizon VA has provided complete documentation of the data supporting its proposed EF&I factor. (VZ-VA Ex. 122 at 207.)

56/ In response to VZ-VA data requests 1-3 and 7-23, in which Verizon VA specifically requested EF&I costs for AT&T/WorldCom's most recent switch purchases, AT&T provided only the total amount paid for its recent switch purchases, but not a specific amount for EF&I. WorldCom refused to provide any information.

— let alone its superiority to the 1998 data Verizon used — one would have to overlook two key facts. First, given the fast-paced development of switching technology discussed in Part III above, the switching equipment used today is undoubtedly different from that used in 1992. Second, there thus is no way to know whether the techniques and costs for installing that older equipment bear any similarity to the costs of installing current equipment. Even aside from this problem, the 1992 factor could not simply be applied to current investment levels without adjustment. As explained above, when the investment level used in calculating an EF&I factor is altered, the ratio of EF&I costs to investments must be recalculated as well. The fact that EF&I costs were 10% of investment costs in 1992 would not mean that a 110% adjustment would be appropriate for today's lower investment costs. At minimum, even assuming the relevance of the actual 1992 EF&I *dollars,* the 1992 *factor* itself would have to be recalculated to avoid producing significantly understated EF&I costs. (*See* VZ-VA Ex. 122 at 203-05.)

AT&T/WorldCom also seek to defend their proposed EF&I factor by referring to a 1992 Open Network Architecture filing with this Commission, in which telephone companies averaged a 10% EF&I factor. (AT&T/WCom Ex. 12 at 120 n. 110.) This simply reiterates the mistakes discussed above: that factor is unrelated to the switching investment assumption that should be used today and is based on different and outdated EF&I techniques and costs. Petitioner's reliance on an 8% proposed EF&I factor in a 1999 Commission Universal Service Fund proceeding is equally misplaced. Most significantly, as Verizon VA explained, that 8% factor reflects the lower switch equipment cost discounts (and thus higher costs used in the EF&I denominator) that small rural telephone companies, in contrast to Verizon, likely command. In any event, that factor includes *only* engineering costs, not the costs of furnishing and installation, which *are* appropriately included in Verizon VA's EF&I factor. (VZ-VA Ex. 122 at 206.)

D. Annual Cost Factors

After converting the material costs of facilities into the installed costs of the facilities, Verizon VA applied annual cost factors (ACFs) to the investment to determine the costs associated with providing that facility as part of the UNE.[57/] The ACF process is an ideal means of identifying the general level of expenses typically associated with a class of equipment or plant and of spreading common costs proportionately. The ACFs, which are calculated based on Verizon's 1999 expense data, are designed to estimate the expense relationships that are and will be associated with each particular class of investment used in the forward-looking network. (VZ-VA Ex. 107 at 48-55.)

Petitioners charge that the expenses that Verizon VA identified are embedded, or are not sufficiently adjusted so as to be forward-looking. In addition, AT&T/WorldCom take issue with certain elements of the ACF calculation process. In both cases, however, AT&T/WorldCom's criticisms are misguided and without logical underpinning.

1. Verizon VA's Expense Factors Are Forward-Looking.

Verizon VA's ACFs are fundamentally forward-looking. Within its cost studies, Verizon VA adjusted all ACFs to reflect increased productivity that is expected in coming years, as well as expected levels of inflation. In addition, the use of plant-account-specific ACFs ensures that Verizon VA's studies reflect the lower repair and maintenance expense that generally would be associated with the use of newer technology assets in the forward-looking network: as explained further below, for example, where the forward-looking network assumes more use of fiber than copper, the ACFs will be more heavily weighted toward the lower network costs associated with

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57/ This issue is covered in VZ-VA Ex. 107 at 48-76 and VZ-VA Ex. 122 at 15-51.

fiber, and thus the overall forward-looking network expenses will be lower. (*See, e.g.*, VZ-VA Ex. 122 at 22-26.)

AT&T/WorldCom nonetheless repeatedly insist that Verizon VA used embedded expenses in its studies. Their attack takes three forms. First, although they initially suggest that Verizon VA did not make productivity adjustments at all (AT&T/WCom Ex. 12 at 81), later, apparently conceding error, they suggest instead that the productivity gains used by Verizon VA are somehow specific to the embedded network, not those "one might expect from putting into place the forward-looking network." (Tr. at 3795.) Second, AT&T/WorldCom simply ignore the ACF methodology used by Verizon VA and contend that Verizon VA's studies do not account for the lower expenses associated with newer facilities. Third, AT&T/WorldCom argue that application of Verizon VA's forward-looking-to-current conversion factor (FLC) is designed to and does produce embedded rather than forward-looking expenses. Petitioners are wrong on all three points.

a) Verizon VA's Productivity Adjustments Are Forward-Looking.

At the hearing, AT&T/WorldCom repeatedly suggested that Verizon VA's productivity factors were developed based on the embedded network, not the forward-looking network. (*See, e.g.*, Tr. at 3795.) But, as Mr. Minion explained, the distinction AT&T/WorldCom seek to make between productivity assumed for the actual network, and productivity assumed for the forward-looking network, is entirely artificial. There is no question, as Mr. Minion agreed, that the productivity gains used by Verizon VA are those that are "actual[ly] achievable . . . for the network that truly will be in place in the future over the planning period." (Tr. at 3795.) He

explained, however, that the advanced technology and plant assumed for the forward-looking network would not affect or increase those productivity figures. (Tr. at 3796.)

First, as Mr. Minion explained, the equipment and plant in the current network generally is fairly new, and thus there is no reason to assume in most cases that equipment in the forward-looking network would produce significant productivity gains that would not already have been realized by Verizon VA. (Tr. at 3796-97.) Thus, as Mr. Minion testified, Verizon VA does not believe that "all brand new DLC [or other equipment] would necessarily have a[] . . . productivity improvement beyond what we reasonably expect to see based upon our existing network." (Tr. at 3796.)

Second, the productivity figures used by Verizon VA are designed specifically to capture the reductions in labor time that should become possible as a result of better or more mechanization of certain processes over time and, as explained below, mergers and other efforts to increase company productivity. (VZ-VA Ex. 122 at 23-24.) In other words, the advances in the network that Petitioners argue should increase productivity are precisely the type of advances that drive the productivity factors Verizon VA used in its studies. Additional productivity adjustments above and beyond those assumed by Verizon VA would not make sense and would exceed anything remotely achievable.[58/] And of course, AT&T/WorldCom have not proposed any specific advance or technique that they believe would increase productivity further than what is assumed by Verizon VA; certainly nothing contained in their MSM provides an example of

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58/ Petitioners have pointed out that generally Verizon VA's productivity adjustment is outpaced by inflation. This simply reflects the level of inflation growth in the telecommunications industry and in particular in Verizon VA's region. (Tr. at 3803.)

more efficient technology that could reduce labor needs beyond the level anticipated by Verizon VA.[59/]

b) The Application of ACFs Reflects the Lower Costs of the Forward-Looking Network.

As noted above, AT&T/WorldCom suggest that Verizon VA failed to account in its studies for the fact that in a TELRIC network, repair, maintenance, and other such expenses may be lower as a result of using newer or different plant assets. But their argument demonstrates at best a basic misunderstanding of the ACF methodology. Any efficiencies that are likely to be experienced in the forward-looking network[60/] are in fact reflected, as Mr. Minion has explained, "in the application of the network ACFs associated with the relevant class of plant." (VZ-VA Ex. 122 at 26.) As Mr. Minion testified:

> Within the unbundled network element studies, to the extent that they reflect a greater amount of fiber and newer equipment, they will reflect the fact that you have less network expenses associated with that unbundled network element than you had in the past.

(Tr. at 3800.) Thus, as noted above, because the forward-looking network assumes more fiber and electronics than copper, the total network expenses associated with the loop, for example,

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[59/] Although Petitioners suggest that Verizon VA failed to account for productivity adjustments in common overhead costs, Mr. Minion demonstrated that this is simply false: the productivity adjustment applies, by virtue of basic mathematical properties, to the common overhead factor as well as to the underlying ACFs to which the common overhead factor is applied. (*See* Tr. at 3806-07.)

[60/] The mere fact that the network might be more "forward-looking" or sophisticated would not *necessarily* reduce expenses or increase productivity. To the contrary, as the automobile has advanced and become more sophisticated, Americans have spent *more* time and money on maintenance for their vehicles, not less. (*See* VZ-VA Ex. 122 at 24-25.) In the telephone network, as well, switch maintenance and repair expenses have risen, not fallen, as digital switch technology has developed. (*Id.* at 25.) Thus, use of the standard, optimistic productivity factors may even understate forward-looking costs.

will reflect the lower repair and maintenance expenses associated with fiber and electronics.[61] (Tr. at 3800-01.)

c) The Forward-Looking Conversion Factor Ensures that Application of Verizon VA's Annual Cost Factors Identifies the Previously Calculated Forward-Looking Expense, Not Embedded Expenses.

AT&T/WorldCom strive to show that the application of the FLC factor within Verizon VA's studies produces embedded expenses. But, as Judge Linsider concluded in his Recommended Decision in the New York UNE Proceeding, rejecting precisely the disingenuous arguments that Petitioners raise here, "[t]he FLC does not convert TELRIC costs to embedded; it merely tries to restore a 'twice-TELRICed' cost to one that recognizes TELRIC only once."[62]

As demonstrated in detail above, the expenses used in Verizon VA's studies are *forward-looking*. Adjustments to reflect productivity and inflation have been made; the copper repair expenses have been adjusted downward; and through use of plant-specific ACFs, the lower costs associated with the plant that should be used in the forward-looking network are reflected in the

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[61] In one case an adjustment was made in the development of the factor itself to reflect the fact that within the specific plant account, expenses are expected to decrease below the level experienced in the current network. Specifically, Verizon VA concluded that the repair costs associated with copper cable in the current network are probably higher than those that likely would be experienced in the forward-looking network in which newer copper cable would be used. (Tr. at 3808.) Based on the experience of Verizon engineers and their conservative assumptions concerning "use of the latest material, design standards, and application guidelines," Verizon VA reduced copper cable repair expenses by 5%. (VZ-VA Ex. 122 at 35 n.29; Tr. at 3808.) This adjustment was not necessary with respect to any other expenses, because as Mr. Minion explained, in most cases the plant in the current network is of fairly recent vintage and thus forward-looking repair expenses should be similar to current expenses; copper cable, in contrast, was placed "30 or 40 years ago." (Tr. at 3797.)

[62] *Recommended Decision on Module Three Issues*, New York Case 98-C-1357 at 44 (New York State Public Service Commission, May 16, 2001) ("*Recommended Decision*").

studies. As Judge Linsider made clear: "[T]he numerator of Verizon's proposed ACF is *forward-looking TELRIC* expense."[63/] The need for the FLC arises because the *denominator* of the ACFs is Verizon VA's embedded investment. In other words, the resulting ACFs state the relationship between forward-looking expenses and embedded investment. When the presumably lower TELRIC investment level is identified at the end of these proceedings, it would not make sense to simply apply the ACF ratios to that new investment: the resulting expense figures would be far lower than the forward-looking expense figures previously calculated by Verizon VA. There is no substantive reason that the expenses would be reduced *beyond* the amount identified by Verizon VA after application of forward-looking adjustments. These new, lower figures would simply be the result of the application of a mathematically-driven "double TELRIC-ing." (VZ-VA Ex. 122 at 18-19.) As Judge Linsider noted, when the ACF "ratio . . . is applied to forward-looking TELRIC investment, [the result is] double counting the TELRIC adjustment, as Verizon argues."[64/]

For example, assume that the current maintenance expenses associated with a $1000 piece of equipment are $150, and that after forward-looking adjustments, Verizon VA assumes that the TELRIC expense would be $100. The resulting ACF would be .10. If the TELRIC cost for that equipment is reduced, however, to $900, application of the .10 ACF would produce only $90 in maintenance expenses, which is $10 less than the forward-looking total expenses of $100. The mere fact that the equipment now costs less does not mean it will cost less to maintain the equipment; it is more likely that no change in maintenance costs will have occurred at all. As Dr. Tardiff explained:

63/ *Id.*

64/ *Id.*